FOREST RESEARCH NOTES

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
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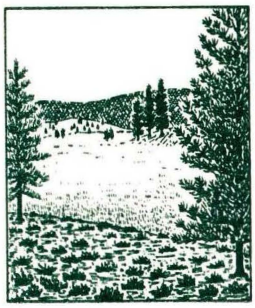

INTERMOUNTAIN STATION
Central Reference File
No. 0.73

No. 119 February 15, 1957

"LIGHT BURNING" IN SOUTHERN CALIFORNIA FUELS

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Light burning has often been suggested as one way to prevent the large and costly fires that periodically scourge southern California. The idea behind "light burning" is to burn the brush during the winter or spring when weather conditions assure easy control of the fire, and thus reduce the quantity of fuel so that a conflagration cannot build up when fire weather is severe.

On the face of it, this idea looks good. Light burning has been suggested and used as a method of hazard reduction. Controlled fire has also been used for years in California to clear brushland for conversion to other types of vegetation. However, southern California's combination of weather, topography, and vegetation is unique. Limited studies of fuel distribution before and after burning indicate that light burning in southern California may increase the fire hazard rather than reduce it.

The Studies

Fuel studies were a routine part of Operation Firestop at Camp Pendleton, California in 1954. Before and after each test fire, samples were taken of the volume, arrangement, and moisture content of all fuels on selected milacre plots.[1/] In August and September, fuel was measured on 3 test fires burned when relative humidities were over 30 percent and winds were less than 10 m.p.h. These are considered ideal weather conditions for light burning. All fires were set with drip torches and all were set to burn with the wind.

1/ Operation Firestop. Fuel studies I. Measurement of fuel bed characteristics of grass and chaparral fuels. 15pp., illus. 1955.

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Results

Under these conditions only sage, the lightest fuel type, burned completely (table 1). Burns in chamise were spotty. Scrub oak, the heaviest brush type, would not carry fire at all.

What did these burns accomplish in the way of hazard reduction? Really very little. Although the sage burned clean, fires in such light fuels are not particularly difficult to control. So light burning of sage only exposed the soil to erosion without making much of a dent in the fire-control job. The spotty chamise burns may increase the hazard by killing some plants without consuming them. Even though the total volume of fuel is reduced in a burn of this kind, the large number of dead, dry plants remaining may actually increase the amount of flash fuels. This can result in hotter, faster-spreading fires than were possible before the light burn. Heavy fuels, such as scrub oak,which are the hardest to control during wild fires, could not be made to burn under weather conditions when safe control could be assured.

Conclusion

These results do not preclude the use of fire for such purposes as building fire lanes and safety islands, or for clearing brush from ridge tops for conversion to less flammable vegetation. However, land managers should recognize that proper use of fire in these situations often requires extensive fuel preparation. They should compare the costs of this type of burning with those of bulldozing, cutting and chipping, or other land-clearing measures. The results do indicate that large-scale light burning in southern California straddles a fine line between twin risks: burns which increase the hazard rather than reducing it, and fires which cannot be controlled.

Results of this limited work also indicate that more intensive studies of brush as a fuel should be undertaken. We need to develop a useful measure of brush flammability in order to explore fully all possibilities for minimizing fire hazard. There is a critical need for intensive fuel studies in southern California.

Table 1.--Dry weight of fuel before and after burning in three types of vegetation, Camp Pendleton, San Diego County, California, 1954

Type	Date	Relative humidity	Wind velocity	Fuel before burning	Fuel after burning	Fuel remaining
		Percent	M.p.h.	Tons/acre	Tons/acre	Percent
Scrub oak	8/12	65	8	40.4	40.4	100
Scrub oak	8/12	65	8	46.8	46.8	100
Sage	9/15	38	5	12.6	0.7	6
Sage	9/15	38	5	13.8	1.3	9
Chamise	9/30	33	7	20.5	3.8	19
Chamise	9/30	33	7	13.0	6.4	49

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